

FARM FACTS

Late blight

Published by Saskatchewan Agriculture and Food

Introduction

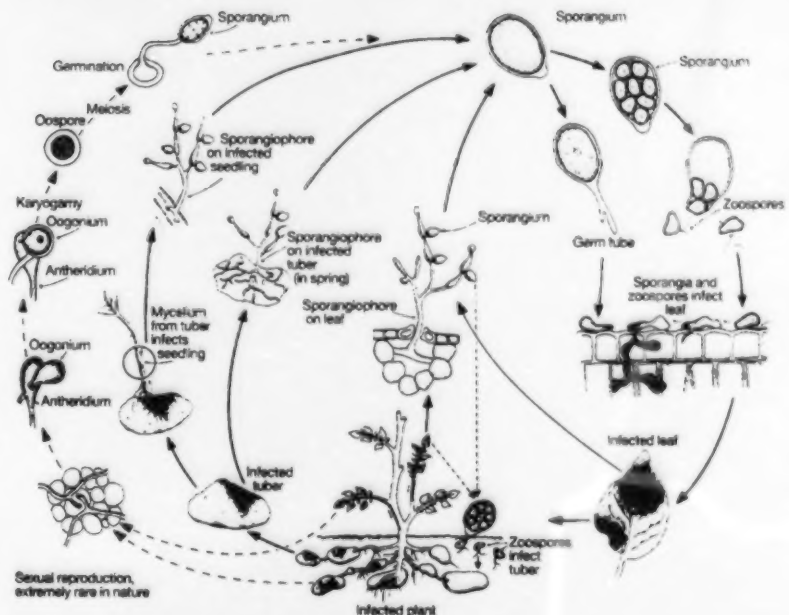
Late blight (*Phytophthora infestans*) has been a concern as long as potatoes have been grown. This fungal disease reached epidemic proportions in Ireland in the mid-1840's, causing starvation and emigration of millions of people to North America.

Until recently, late blight has not been a major problem in Western Canada. However, increased potato acreages coupled with changes in production practices and the genetics of the fungus have recently moved late blight to the forefront as a disease problem in local potato fields. Commercial growers and home gardeners alike must learn how to reduce the risk of late blight infection in their crops and learn how management practices influence the arrival and development of this disease.

Symptoms

Late blight can infect any member of the potato family (including tomatoes and peppers) at any time during the growing season. Infection on the leaves and stems first shows up as a fast-growing, water-soaked lesion surrounded by a pale green halo (Figure 1).

The infection often occurs near the margins or mid-vein of the leaf. The lesion can cross the vein of the leaf and a whitish cottony growth may be produced on the underside of the lesion. Spores produced on these lesions are spread by wind, water or mechanical transmission to infect neighboring plants. The newly arrived A2 strains of late blight have a greater ability to infect the stem than the A1 strain. Severe rotting of tissues caused by late blight generates a very strong, distinctive odour.



16.11T1 Late blight; disease cycle of *Phytophthora infestans* on potato and tomato. Reprinted by permission from G.H. Agrios, Plant Pathology. © 1988 Academic Press

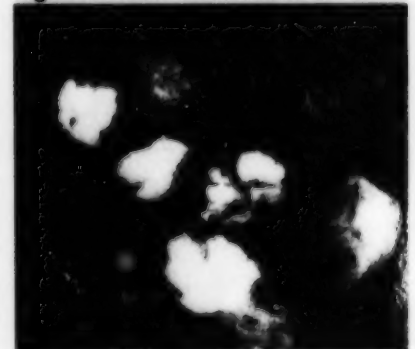
Tubers become infected if the spores are washed from the leaves through the soil, coming into contact with the potato. Infected tubers have a reddish brown discoloration just underneath the surface soon after infection (Figure 2). The

resulting infection will produce a dry rot, however secondary infections such as bacterial soft rot and fusarium dry rot may enter tubers in storage and cause further rotting.

Figure 1. Lesions on leaf and stems



Figure 2. Tuber discoloration's



Monitoring System

Hot and humid conditions promote the development and spread of late blight. Although Saskatchewan is renowned for its cool and dry summer weather, conditions suitable for the development of late blight still commonly occur – especially following rainfall, irrigation or even a heavy dew. On hot, dry days, conditions deep in the crop canopy may still be ideal for development of late blight. Once the disease becomes established, wind can spread the spores considerable distances.

Saskatchewan has a late blight forecasting system in many of the potato producing areas of the province. During the growing season, weather conditions are monitored to determine if and when conditions are most conducive to the development and spread of late blight.

Values from the monitoring system and recommendations for preventative spray schedules can be found on the Saskatchewan Agriculture and Food website at www.agr.gov.sk.ca, then go to the Crops section and then click on horticulture. The Saskatchewan Seed Potato Growers Association (SSPGA) also has a link to this site at www3.sk.sympatico.ca/sspga. Growers can also access values on the late blight hotline at 1-888-419-7783 (SPUD). These values are updated two to three times during the week, depending on environmental conditions.

Prevention

No potato varieties are truly resistant to late blight but some exhibit a degree of tolerance to the fungus. Unfortunately, most of the locally popular varieties, including Shepody, Russet Norkotah, Norland and Ranger Russet are quite sensitive to late blight. Always plant varieties that you are certain you can market.

Potential sources of late blight include infected seed and spores drifting from adjacent diseased fields or cull piles. Any volunteer potato plants in last year's field or in cull piles should be eradicated immediately as they may represent a source of infection. Cull piles should be disposed of by either feeding to livestock or burying them. Potatoes should be buried a minimum of six feet deep and covered over.

Once a plant has become infected with late blight, there are **NO** production practices or crop protection materials that can **cure** the infection. Application of preventative fungicides **before** infection has taken place is the best defense. Complete coverage of the foliage, including the stems, is essential. The first spray should go on when the plants are 6 – 8 inches high. At least one spray and preferably two should go on before row closure to protect the lower canopy. Adequate coverage of the lower leaves is impossible once the canopy develops.

If late blight pressure is heavy in your area, there are systemic fungicides that will protect new growth from infection for 10 to 14 days. These products are more expensive but they offer an added window of protection if applied at the right time. Refer to the Guide to Crop Protection for a list of all fungicides currently registered for use on potatoes or contact your provincial potato specialist.

Storing the Crop

To prevent contamination of the potatoes with spores at the time of harvest, ensure that the plant, vines and leaves are completely dead before harvest. Late blight spores can not survive without green living tissues. Fields with high levels of late blight should be harvested last – this allows infected tubers to breakdown prior to harvest. It also insures that "risky" lots are stored near the front of the storage in case the load must be moved quickly. Ideally, any crop damaged by late blight should be stored separately. Prior to storage, grade out all tubers that look suspect. Potatoes from infected fields should not be sold for seed and should be marketed as processing or table stock as soon as possible.

Monitor your storage, looking for "hot" spots where late blight may be causing breakdown in the pile. Ensure your storage has adequate airflow to dry up any wet spots, but remember that excessive air circulation will reduce the weight and the profit potential of the crop.

TIPS for late blight management

- Always purchase certified seed. Ensure that your seed supplier has followed an adequate late blight control program.
- Eliminate volunteer plants and cullpiles.
- Scout your fields weekly for any signs of late blight symptoms.
- A couple of early sprays are critical to provide spray residue in the lower part of the canopy as the crop progresses.
- A 7 – 10 day spray schedule should be followed on a normal year. The interval between sprays can be increased or lessened depending on weather condition.
- Check the Late Blight Forecasting hotline and website for conditions in your area.
- If an infected area is found, destroy the spot and a surrounding area of about double the size. Neighboring plants that look healthy today may show symptoms within a few days and become another infection source. Small infection spots may be pulled up or disked under. Larger infected areas should be desiccated at the high rate to provide rapid kill down of the infected plants.
- A good sized, firm and properly formed hill should be made. This will increase the distance a spore must travel, and will eliminate cracks in the hill that quicken spore travel.
- Use of a seed piece treatment containing an EBDC (Polyram, MancoPlus, Potato ST 16, Tuberseal) will lessen the risk of transmission of the infection during the cutting process.
- A typical late blight spore can travel a few hundred miles.
- Any areas that will have longer wetness periods are the most at risk of infection. These include low spots in the field, pivot points, field margins, shelter belts and other areas difficult to spray.
- Late blight is a community disease problem in that it will infect any plants it comes into contact with in an area. Therefore it is important that all growers remain vigilant in scouting their fields on a regular basis.

Always read and follow the label directions and recommended rates. Do not exceed the label rate, as no extra protection will be expected.

This fact sheet was prepared with assistance of Dr. Doug Weaver and Dr. J.R. Thomas, Dr. David P. H. Jones, University of Saskatchewan.

